



United States Department of Agriculture
Forest Service

Tamarack Cattle and Horse Allotment Management Plan

**Heppner Ranger District
Umatilla National Forest**

Biological Evaluation and Botany Resource Report

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1 Introduction

The Tamarack Cattle Allotment is located in the southern portion of the Heppner Ranger District in portions of the Wall Creek and Lower John Day River/Kahler Creek watersheds, within Grant and Wheeler counties. It encompasses approximately 19,441 acres of which 19,391 acres are on National Forest System Lands and 50 acres are on private lands. The main drainages within this allotment are Big Wall, South Fork of Big Wall, Dark Canyon, Lost Canyon, Haystack, West Bologna, Tamarack, and Burnt Cabin. Elevation ranges from 2,500 ft. near Wall Creek to 4,975 ft. at Tamarack Mountain. For details on the various alternatives and the project location, see the associated environmental analysis.

This Biological Evaluation (BE) analyzes effects or impacts from all potential actions to plants, lichens, and fungal species, and their respective habitats, that are federally-listed as threatened, endangered, or proposed for federal listing under the Endangered Species Act of 1973 as amended. It also addresses species currently identified as sensitive (FSM 2670.5, USDA Forest Service, July 13, 2015) by the Regional Forester of the Pacific Northwest Region. Species designated as sensitive are those for which there are conservation concerns, and for which special management considerations may be implemented. For this report, these species are collectively called TES species.

This report provides analysis of potential impacts to Forest Service designated sensitive plants, and their habitats, for the environmental analysis of the Tamarack cattle and horse allotment management plan. This botanical report addresses the No Action (Alternative 1), current management (Alternative 2), and the proposed action (Alternative 3) alternatives.

1.1 Regulatory Framework

1.1.1 Federal Laws

1.1.1.1 Endangered Species Act

The Endangered Species Act of 1973 (ESA) mandates all Federal departments and agencies to conserve listed species and to utilize their authorities in furtherance of the purposes of the ESA. Section 7(a) (2) directs all Federal agencies to insure that any action they authorize, fund, or carry-out does not jeopardize the continued existence of an endangered or threatened species or designated or proposed critical habitat. The Umatilla National Forest has one listed Threatened plant, Spalding's Catchfly (*Silene spaldingii*). In addition, whitebark pine (*Pinus albicaulis*) is a candidate for federal listing.

1.1.1.2 National Forest Management Act

The National Forest Management Act of 1976 (NFMA) reorganized, expanded and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on national forest lands. NFMA requires the Secretary of Agriculture to assess forestlands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. It is the primary statute governing the administration of national forests.

1.1.1.3 National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA) directs federal agencies to "...ensure that environmental information is available to public officials and

citizens before decisions are made and before actions are taken” [40 CFR §1500.1(b)].

1.1.2 Forest Service Policy

1.1.2.1 Forest Service Manual 2672.1 Sensitive Species Management

Sensitive species of native plant and animal species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing. There must be no impacts to sensitive species without an analysis of the significance of adverse effects on the populations, its habitat, and on the viability of the species as a whole.

1.1.2.2 Forest Service Manual 2672.4: Biological Evaluation Process

The Forest Service shall review all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened, proposed, or sensitive species. The biological evaluation is the means of conducting the review and of documenting the findings. Document the findings of the biological evaluation in the decision notice. Where decision notices are not prepared, document the findings in Forest Service files. The biological evaluation may be used or modified to satisfy consultation requirements for a biological assessment of construction projects requiring an environmental impact statement.

The objectives of the biological evaluation process are:

1. To ensure that Forest Service actions do not contribute to loss of viability of any native or desired non-native plant, or contribute to a trend towards Federal listing of any species.

2. To comply with the portion of the Endangered Species Act that requires that actions of Federal agencies not jeopardize or adversely modify critical habitat of federally listed species.
3. To provide a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process.

1.1.2.3 Forest Service Manual 2070.2: Native Plants Policy Objectives

1. Maintain, restore or rehabilitate native ecosystems so that they are self-sustaining, resistant to invasion by non-native invasive species and/or provide habitat for a broad range of species including, threatened, endangered, and rare species.
2. Maintain adequate protection for soil and water resources, through timely and effective revegetation of disturbed sites that could not be restored naturally.
3. Promote the use of native plant materials for the revegetation, rehabilitation and restoration of native ecosystems.

1.1.2.4 Forest Service Region 6 Revegetation Policy

Use local native plant species to meet management objectives. Follow appropriate seed and plant movement guidelines.

1.1.3 Umatilla National Forest Land and Resource Management Plan

The Umatilla NF Land and Resource Management Plan (USDA Forest Service, 1990) includes the following goals, standards and guidelines for ecosystem diversity, threatened and endangered and sensitive species (TES), and wildlife

habitat resources. Although some of these items do not directly address sensitive species, protections for unique and unusual wildlife habitat also provide protection for sensitive plant habitats.

1.1.3.1 Forest Plan Goals

Forest Management Goal 6: Protect and perpetuate special areas and related resources for their unique values (page 4-2).

Forest Management Goal 11: Maintain or improve habitats for all threatened or endangered plant and animal species on the Forest, and manage habitats for all sensitive species to prevent the species from becoming threatened or endangered (page 4-2).

Forest Management Goal 13: Provide for a diversity of plant and animal communities and species consistent with overall multiple-use objectives. Maintain or enhance ecosystem functions to provide for the long-term integrity (stability) and productivity of biological communities (page 4-2).

Forest Management Goal 14: Provide areas for research and education purposes which are typical of unique natural ecosystems and are in undisturbed or nearly undisturbed condition (page 4-2).

1.1.3.2 Forest Plan Desired Future Conditions

Special Areas

A variety of special management areas will be featured attractions as part of the diversity of recreation opportunities. Parts of the Grande Ronde, Wenaha, and North Fork John Day rivers, presently classified Wild and Scenic Rivers, will accommodate increased use; the two scenic areas

(Grande Ronde and Vinegar-Indian Rock) are major attractions which will also receive increased use. The variety of special interest areas on the Forest (historical, botanical, geological, and cultural sites) is being developed as planned, and will contribute toward educational and other recreational experiences. The Forest Scenic Byway will also be a featured attraction (page 4-5).

Wildlife

Riparian areas will continue to provide a diversity of habitat conditions. Unique habitats, such as cliffs, talus, and wet areas, will receive protection (page 4-7).

Threatened, Endangered, and Sensitive Species

All management activities recognize and will be responsive to the requirements of the Endangered Species Act: Surveys for threatened, endangered, and sensitive plants will essentially be completed (within the next 15 years), lists will be revised, and management plans will protect and enhance identified plants. Federal and regional lists (T&E) will continue to change. Surveys will probably document large numbers of some plants and will result in those species being removed from the lists; other species will probably be located for the first time and will be added. The number of botanical areas on the Forest can be expected to increase slightly as new unique areas are found during sensitive plant surveys (page 4-7).

1.1.3.3 Forest Plan Objectives

Threatened, Endangered, Sensitive Plant and Animal Species

There are no known federally listed threatened or endangered plant species on the forest (NOTE: This has changed, Spalding's catchfly is now listed under ESA as threatened). Twenty-two plant species found on the Forest have been listed on the Region 6 Sensitive plant list (Note, this number has also now changed). Before a project is initiated, inventories for populations and distribution of threatened, endangered, and sensitive species will be conducted on a priority basis. Biological evaluations will be prepared. Each inventory will list all plant species found in the survey area. Previously surveyed areas can be check for specie occurrence when the Federal and regional plan lists change (page 4-28).

Biological evaluation and any required surveys and inventories of all threatened, endangered, and sensitive species will be completed prior to all project activities to insure the protection and/or mitigation of all TES species (page 4-29)

The Forest will coordinate closely with the U.S. Fish and Wildlife Service concerning all proposed management activities that have the potential to impact threatened or endangered species. The Forest will participate in the recovery objectives for both bald eagles and peregrine falcons outlined in Chapter III of the FEIS (Note, also for Spalding's catchfly now that it has been added to the ESA list) (page 4-29).

Monitoring will be used in the evaluation of estimated outputs in the FEIS and the anticipated habitat conditions described in the Forest-wide

Standards and Guidelines, and in the management areas. The evaluation will determine if wildlife habitats and population trends occur as projected, and will form the basis for changing plan direction if necessary (page 4-29).

1.1.3.4 Forest-wide Standards and Guidelines

Nongame wildlife habitat Standard and Guideline (S&G) 4: Cliffs, talus, and caves are recognized as relatively unique habitats of the Forest, and all potentially disturbing or altering management activities will be carefully evaluated on the ground during the planning process (page 4-57).

Nongame wildlife habitat S&G 5: Seeps, springs, bogs, wallows, and other wet areas...are inherently unique and will be evaluated on a project level basis for their value as wildlife habitat and to provide appropriate levels of protection (page 4-57).

Riparian and fish habitat S&G 5: Seeps, springs, bogs, and other wet areas, generally under 10 acres, are inherently unique and will be evaluated on a project level basis for their wildlife and other values and will be given appropriate levels of protection. Where needed, employ mitigation measures to protect unique vegetation, wildlife, and water related characteristics (page 4-59).

Range S&G 2: Allotment management plans will include a strategy for managing riparian areas for a mix of resource uses. A measurable desired future riparian condition will be established based on existing and potential vegetative conditions (page 4-63).

Ecosystems and diversity standards and guidelines (page 4-66):

1. Maintain native and desirable introduced or historic plant and animal species.
2. Provide or develop an ecologically sound distribution and abundance of plant and animal communities and species on the stand, basin, and forest levels.
3. Provide for all seral stages of terrestrial and aquatic plant associations in a distribution and abundance that meets the goal.
4. Meet standard and guideline requirements.
5. During project planning, site-specific management prescriptions should be developed and evaluated that meet objectives for biological diversity and ecosystem function.
6. Reductions in diversity of plant and animal communities and tree species from that expected in a natural forest, or from that similar to the existing diversity in the planning area, may be prescribed to meet overall multiple-use objectives.
7. The introduction of plants will be assessed and controlled to meet management objective and to prevent any native species (or plant community) from becoming endangered or threatened.
8. Plant community ecology is sensitive to management changes. The communities will be monitored for diversity relative to successional stages and type conversions.
9. Identify, inventory, and provide for local, traditional Native American food and cultural plants.

Timber management species diversity S&G 2: Reforestation of “noncommercial” tree species (hardwoods and conifers such as Pacific yew, Western juniper) should be considered in meeting management area objectives (page 4-74).

Timber management species diversity S&G 3: Special and unique ecological communities such as aspen and other hardwood stands, seeps, springs, bogs, and other riparian areas should receive special attention and protection from potentially damaging management activities. Silvicultural prescriptions will specifically address measures to protect, maintain, and enhance aspen and other hardwood clones, clumps, and stands (page 4-74).

Threatened, endangered, and sensitive species standards and guides (pages 4-89 to 4-90):

1. Legal and biological requirements for the conservation of endangered, threatened and sensitive plants and animals will be met. All proposed projects that involve significant ground disturbance or have the potential to alter habitat of endangered, threatened or sensitive plant and animal species will be evaluated to determine if any of these species are present (FSM 2670 Threatened, Endangered and Sensitive Plants and Animals).
2. Where endangered or threatened species are present, the required biological assessment process will be carried out according to the requirements of the Endangered Species Act (Public Law 93-205); consultation requirements with USDI Fish and Wildlife Service and state agencies will be met. Before the project can be carried out, protection or mitigation requirements shall be specified (36 CFR 219.27(a) (8)). Habitat

for existing federally classified threatened and endangered species will be managed and monitored to achieve objectives of recovery plans.

3. When sensitive species are present, a biological evaluation will be prepared. There must be no impacts to sensitive species without an analysis of the significance of adverse effects on its population, habitat, and on the viability of the species as a whole. Habitat for sensitive plants and animals will be managed to ensure that the species do not become threatened or endangered through Forest Service actions. Species management guides will be prepared over the next 5 years and will be used as strategies for ensuring that sensitive species do not become threatened or endangered or result in a loss of species viability.
4. For endangered, threatened and sensitive species, determine and monitor the status of populations and habitats and the strategies implemented for protection. Maintain and update lists of threatened, endangered, and sensitive plants and animals periodically as new information is collected....
5. The Forest and ranger districts will keep records and inventories of essential and critical habitats and their distribution. Inventories will include careful monitoring of the species and their habitats.
6. Collection of TES plant species will only be allowed under permit. The issuance of permits must be preceded by the same degree of assessment required for other projects.
7. Maintain contacts with Federal, state, and other agencies, groups, and individuals concerned with the management of TES species (USDA Forest Service 1981).

1.2 Topics and Issues Addressed in This Analysis

1.2.1 Purpose and Need

See the associated environmental analysis document for a discussion of the purpose and need. This project was not initiated due to any particular need to improve habitat for sensitive plants.

1.2.2 Issues

No botany related key or analysis issues, or indicators were identified during scoping. The following analysis will focus on effects as outlined in the Forest Service biological evaluation process.

1.2.3 Resource Indicators and Measures

Since botanical resources were not identified as part of the purpose and need for the project, and no issues regarding botanical resources were identified, no quantitative resource indicators or measures were included for this project for sensitive species habitat. Discussions of impacts are more qualitative in nature.

1.3 Methodology

1.3.1 General Methods

There are currently 66 species of Forest Service designated sensitive plants documented, or suspected, to occur on the Oregon portion of the Umatilla National Forest (USDA Forest Service, July 13, 2015). See Appendix A: Umatilla National Forest Sensitive Plant Occurrence and Effects Calls at the end of this report for a complete list of sensitive plant species for the Oregon portion of the Umatilla National Forest.

This report describes sensitive plant species, and their habitats, potentially found in the project planning area. Project design criteria (PDCs) are proposed to help protect known sensitive plant populations, and to protect potential sensitive plant habitat. Potential direct, indirect, and cumulative effects of the alternatives on known sensitive plant populations, and potential sensitive plant habitat, are presented (see effects analysis). Effects analysis determinations follow definitions as outlined in Forest Service Manual 2672.42.

Rather than evaluate effects to so many species individually, this analysis focuses on how potential activities may impact habitats that may support sensitive plant populations. Species documented in the project area are addressed individually.

1.3.2 Information Sources

A pre-field review determined the probability that sensitive plant populations, and potential sensitive plant habitat, are located within, or adjacent to, the project planning area. This information was used to determine the need for, and intensity of, botanical surveys.

The following sources of information were used to determine which species, and their respective habitats, may occur within, or adjacent to, the project planning area:

- Region 6 Regional Forester Special Status Species List (USDA Forest Service July 13, 2015)
- GIS mapping layers (vegetation, streams and wetlands, aerial imagery)
- Project GIS layers showing potential activity units
- Sensitive Plants of the Umatilla and Malheur National Forests (USDA FS, 2006).
- Field Guide to Sensitive Plants of the Malheur National Forest (USDA FS, unpublished document, 2015).
- United States Department of Interior Fish and Wildlife Service (USDI-FWS) website. This website identifies which federally listed, proposed, and candidate species occur in each county of each state. This website was queried to determine which federally

listed, candidate, and proposed plant species may occur in Grant and Baker Counties, Oregon.

- Forest Service Natural Resource Manager database (USDA Forest Service 2013). This database includes information on where botanical surveys have been done on the forest in the past. It also contains information on sensitive plant populations. This database was queried to determine where additional surveys may be needed, and where populations of sensitive plants are known within, and adjacent to, the project planning area.

1.3.3 Incomplete and Unavailable Information

Landscape scale analysis does not allow for detailed site-specific plant surveys. Most surveys for this project were done for forest vegetation management projects. Only a few limited surveys have been done specifically for this analysis. It is also nearly impossible to conduct botanical surveys that cover 100% of potential sensitive plant habitat in any particular project area. It is certain that cattle grazing is occurring in areas that have not been thoroughly surveyed. Therefore, it is possible that there may potentially be impacts to undiscovered populations of sensitive plants.

Some sensitive plant species do not produce above-ground plants every year. These plants include most grape-ferns (*Botrychium spp.*), and many annual species which are dependent upon sufficient early spring rains. Some of the annual sensitive species include least phacelia (*Phacelia minutissima*), dwarf evening-primrose (*Eremothera pygmaea*) annual muhly grass (*Muhlenbergia minutissima*), and lowland tooth-cup (*Rotala ramosior*). It is therefore possible that surveys may not detect these plants in years when conditions do not favor germination.

Some species, such as the least phacelia, dwarf evening-primrose, and grape-ferns, are also so tiny and difficult to find in dense vegetation that even expert botanists may overlook them during surveys.

Many of the non-vascular plants (mosses, liverworts, and lichens) are very difficult to identify. Therefore, it is possible that botanists may overlook some of these species.

For all of these reasons, it is not possible to state with 100 percent certainty that all sensitive plant species will be detected during sensitive plant surveys.

There are very few empirical studies on the impacts of grazing to most sensitive plant species. The strategy for management of known populations has generally been avoidance of activities that may impact populations. Therefore, all discussion of potential impacts to sensitive plant populations and habitat is based upon general experience and inferred responses based upon observations and studies of more common species.

1.3.4 Habitat Analysis Groups

This analysis evaluates potential impacts of the proposed actions to sensitive plant species. There are 66 sensitive plant, and lichen, species documented or suspected to occur on the Oregon portion of the Umatilla National Forest. Rather than evaluate effects to all of these species individually, this analysis takes a more efficient, and intuitive approach: plant species occur in major habitat groups, and effects are discussed in relation to these habitat analysis groups.

Sensitive species lists are dynamic and changes to the lists occur every few years as new information is obtained. Many endemic and globally rare species are permanently on the sensitive species lists due to their inherent rarity. Other species are removed when a sufficient number of occurrences have been discovered throughout their range, and/or when populations are deemed to be secure and safe from threats. Conversely, other species are added to the list when it has been determined that the survey efforts indicate that the species is truly rare and in need of being deemed sensitive by the Regional Forester. Using habitat analysis groups to evaluate effects to sensitive species will thus cover potential impacts to sensitive species that are currently on the list, as well as those rare species that may be designated as sensitive in the future. Thus, this analysis does not evaluate effects to specific sensitive species. Sensitive species that are documented in the project area are discussed individually.

Habitat analysis groups are primarily based on the potential vegetation hierarchy of the Blue Mountains (Powell et al. 2007) and related plant associations (Crowe & Clausnitzer 1997, Johnson 2004, Johnson & Clausnitzer 1992, Johnson & Swanson 2005, Wells 2006). Plant

associations, plant communities, and plant community types are all potential vegetation types (Powell et al. 2007). They are a relatively fine scale description of plant habitats. These categories are too detailed and numerous to be useful units for analysis on a large landscape scale. Potential vegetation types are lumped into plant association groups (PAGs). Plant association groups are relatively coarse-scale groups of various habitats that can be further lumped into potential vegetation groups (PVGs). Potential vegetation groups are aggregations of plant association groups with similar environmental regimes and dominant plant species. Each aggregation typically includes PAGs representing a predominant temperature or moisture influence.

The habitat analysis groups that are in the affected environment section of this report are roughly based on PVGs. For example, habitat analysis groups may correspond directly to a PVG (e.g. cold upland forests), correspond to a group of PVGs (e.g. warm riparian forests *and* shrublands), or PVGs may be further divided based on important ecological characteristics (e.g. cold and warm riparian herb lands are divided and recombined into wet meadows, moist meadows, peatlands). The habitat analysis groups that are presented below were developed because they represent the best approach to assess potential impacts to plant biodiversity. They are presented in two major categories: upland habitats and riparian/aquatic habitats.

1.3.5 Spatial and Temporal Context for Effects Analysis

1.3.5.1 Direct and Indirect Effects Boundaries

The spatial context for this analysis is the project area. Since plants do not generally move over large areas quickly, and no downstream effects are anticipated, it is not necessary to analyze effects to sensitive plants outside of the planning area.

The temporal context for effects analysis includes short term and long term effects. Short-term effects are considered to be one to two years after project implementation. These would generally be from direct effects such as ground

trampling or ingestion. Long term effects for this analysis are considered to be longer than two years. These effects would generally be from indirect effects such as changes in sunlight, erosion rates, hydrologic regimes, and changes in animal grazing patterns and intensity.

1.3.5.2 Cumulative Effects Boundaries

The spatial boundaries for analyzing the cumulative effects to botanical resources is the project area because plants do not move across the landscape to any significant extent. The temporal boundaries for analyzing the cumulative effects are from the time of colonization by Europeans to ten years into the future.

1.3.6 Basis of Effects Determinations

1.3.6.1 Federally Listed, Proposed and Candidate Species

Under the implementing regulations (50 CFR 402) of the Endangered Species Act, Federal agencies must review their actions and determine whether the action may affect federally listed and proposed species or proposed or designated critical habitat. To accomplish this, Federal agencies must request from the Service a list of species and critical habitat that may be in the project area or they can request our concurrence with their species list. This list is now obtained on the internet.

Once a species list is obtained or verified as accurate, Federal agencies need to determine whether their actions may affect any of those species or their critical habitat. If no species or their critical habitat are affected, no further consultation is required. If they may be affected, consultation with the Service is required. This consultation will conclude either informally with written concurrence from the Service or through formal consultation with a biological opinion provided to the Federal agency.

The possible effect determinations for federally listed plants outlined in the Section 7 consultation process are as follows:

No Effect

If species or critical habitat will not be exposed directly or indirectly to the proposed action or any resulting environmental changes. No consultation with the FWS is required for No effect calls.

May Affect

If data indicate the species and habitat may respond upon exposure, or if data are equivocal or lacking to justify a determination of "no effect", conclude "may affect"

If the listed resource is likely to respond in only a beneficial manner, conclude "May affect, not likely to adversely affect" and submit your finding and supporting rationale to the appropriate ES Field Office and request concurrence.

If the listed resource is likely to respond in a negative manner but such responses are expected to be insignificant, or if the listed resource is likely to respond in a negative manner, but the likelihood of either exposure, or such a response is discountable, then conclude "May affect, not likely to adversely affect" and submit your finding and supporting rationale to the appropriate ES Field Office and request concurrence.

If you cannot conclude that the response will be wholly beneficial or insignificant, or that the exposure or response is discountable, then you must conclude that the project "May affect, likely to adversely affect" and formal consultation must be done with the FWS.

1.3.6.2 Forest Service sensitive species

The four possible effect determinations for sensitive plants are outlined in Forest Service Manual 2670:

No Impact (NI)

When sensitive species occur in habitats which are not expected to be directly or indirectly affected in any way, they are given a “No Impact” determination. This is also used for known specific existing populations where no project activities are proposed, or the population is buffered or otherwise protected.

BI When sensitive species, and their potential habitats, are expected to be favorably affected by a particular alternative, they are given a “Beneficial Impact” determination.

May Impact Individuals or Habitat (MIIH)

When sensitive species, and their potential habitats, occur that could possibly be negatively affected, they are given a determination of “May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species”. This determination is used in cases where there is unsurveyed potential habitat, or where potential impacts are uncertain, or considered to be relatively minor.

This determination acknowledges that the action could have negative impacts, but due to the following factors, the degree of consequences is not known with certainty:

- The complexity of the proposed action
- The differential impacts across the landscape
- The lack of best available science

Additionally, the MIIH call recognizes that even the most substantial impacts of the proposed action will not contribute to a trend toward listing the species under the Endangered Species Act. The effects are expected to be minor enough that they will not cause a loss of viability of the species in the planning area.

Will Impact Viability

When sensitive species, and potential habitat that will most likely be negatively affected by the project, are present, they are given a determination of “Will impact individuals or habitat with a consequence that the action may contribute to a trend towards federal listing, or cause a loss of viability to the population or species”. This determination is used in cases where negative impacts will clearly occur, and they are of a magnitude that they may contribute to crossing a threshold leading to Federal Listing under the Endangered Species Act.

2 Affected Environment

2.1 Historic Botanical Surveys

A query of the USFS Natural Resources Manager database shows that much of the area has had some level of botanical survey since the early 1990s. The information in the database on these surveys often only includes a date and a mapped survey

area. There is no information in the database on targeted species, or any information on habitat conditions. When most of these surveys were done, there were only vascular plants on the sensitive plant list. The current sensitive list now includes non-vascular plants and lichens, as well as several vascular plants that were not on the sensitive list at the time of the historic surveys. Listed below are the details of the historic surveys. Note, many of the survey areas overlapped, so the total acres shown here are cumulative.

Tamarack Botany Surveys

Survey ID	Survey Name	Acres
061400S00264	Bologna Basin 93	10127.8173
061400S00291	Coffee Pot 92	16324.6237
061400S00549	Tamarack-Mahogany II 93	14898.2885
061400S00550	Tamarack-Mahogany P.A. 88	15341.8593
061400S00607	Wall Creek Fish Enhancement 91	253.599
061400S00623	Whitetail P.A. 91	7036.2744
061400S00681	Rimrock Carex Blitz 99	41703.3909
061400S00784	Little Tamarack Prescribed Burn 91	948.1617
061400S00792	Upper Wall TS 91	3613.7228
061400S00793	Upper Wall T.S. 91	3977.5061
061400S00796	Putnam Subsoil 91	61.0195
061400S00840	N.F.J.D. Roadbrushing 92	6482.8625
061400S00853	Upper Wall TS II (24e) 95	28.7135
061400S00869	Upper Wall TS II (24c) 95	4406.1228
061400S00920	Tamarack/Monument allotment 2002	16808.132
061400S01075	West End OHV ELBO Blitz 2007	3231.0157
061400S01116	Tamarack Mt. 2010	483.0903
061400S01135	Kahler 1 2012	2275.9417
061400S01171	Kahler surveys 2013	1018.7874
Total Acres		149020.

Table 1. Historic botanical surveys in the project area

2.2 Project specific botanical surveys

In the summers of 2015 and 2016, botanical surveys were conducted for this project. The focus of the surveys was to search for sensitive vascular plant species. Special emphasis was to search for sensitive species that have been historically

documented nearby. Two populations of the Clearwater cryptantha were found during the surveys of 2016. All proposed spring developments were surveyed during the 2016 surveys. No sensitive plant populations were found in any of the proposed spring development areas. A comprehensive list of vascular species encountered was recorded. This is available in the project files. See the table below for details of the dates and names of surveyors.

Table 2. Project specific botanical surveys

Date	Surveyor(s)
05/19/2015	Allen and Frazee
06/16/2015	Allen and Robins
06/17/2015	Allen and Robins
06/18/2015	Allen and Robins
06/19/2015	Allen and Robins
06/30/2015	Allen

Date	Surveyor(s)
07/01/2015	Allen
07/02/2015	Allen
06/20/2016	Darrach
06/21/2016	Darrach
06/22/2016	Darrach
06/23/2016	Darrach

2.2.1 Sensitive plant populations

2.2.1.1 Federally listed, proposed, and candidate plant populations and habitat

The Fish and wildlife Service website and the Forest Service NRM databases were queried to determine which plants of concern under the Federal ESA may be present in the project area (query conducted on June 14, 2016).. The only species listed on the FWS website is whitebark pine, a federal candidate, which occurs in Grant County. However, this species only grows at elevations much higher than what is present in the project area. Therefore, there is no habitat for this species in the project area.

2.2.1.2 Sensitive plant populations in the project area

Clearwater cryptantha (*Cryptantha grandiflora*) is the only documented Forest Service sensitive plant species in the project area. This species was added to the sensitive plant list in 2015. This

species was first identified in 1909. Later, it was considered to be a variety of common cryptantha (*Cryptantha intermedia*), a common and widespread species. Recent information indicates that it is actually a distinct species. Since this species was only recently identified as different from the common species, it was not on any rare list in the past. Botanists on the Umatilla National Forest have been looking for this species for only a few years. There have not been any surveys for (or documented populations) for this species on the Malheur or Wallowa-Whitman National Forests (personal communication with Wallowa-Whitman and Malheur NF botanists). The historic collections of this species are in the Clearwater River, Idaho area, and around Clarkston Washington. It was recently collected on the Pomeroy RD of the Umatilla NF (M. Darrach, 2016). The range of the species is not currently well defined.

Clearwater cryptantha grows on dry, rocky slopes. It has only been found on the Umatilla NF on a specific type of substrate, which is a Columbia River basalt variant that is lithologically a gabbro rather than a true basalt, so it is chemically actually quite different from most of the Columbia River basalts that dominate the Blue Mountains (M. Darrach, personal communication, 2016).

Two populations of this species were documented in the Wildhorse pasture in the Tamarack allotment in 2016. They occur on dry rocky slopes in the South Fork Wall Creek drainage. Some cattle trailing was noted in the populations, but no grazing or direct trampling were noted. Heavy amounts of annual grasses (cheatgrass and North Africa grass) were noted to be growing right in with the cryptantha. It is thought that the annual grasses are probably competing with the cryptantha for water. The population (element occurrence number 0614021068) in T. 7 S., R. 26 E., Section 28 has 1,400 plants scattered in three areas. The second population (element occurrence number 0616021069) in T. 7 S., R. 26 E., Section 31 supports approximately 500 plants in a small scattered area.

2.2.1.3 Nearby Populations of Sensitive Plants (Within Five Miles of the Edge of the Allotment)

Pauper milkvetch (*Astragalus misellus* var. *misellus*) occurs about three miles southeast of the allotment (T8S R26E Sec. 35) on Forest Service land. This species grows on open sagebrush

dominated slopes on sandy, often rocky soils. Associated species include big sage (*Artemisia tridentata*), low sage (*Artemisia arbuscula*), stiff sage (*Artemisia rigida*), Thurber's needlegrass (*Achnatherum thurberiana*), and Sandberg's bluegrass (*Poa secunda*). This species only occurs in central and northeastern Oregon. Documented populations are in Deschutes, Grant, Harney, and Jefferson Counties. The population near the Tamarack allotment is the only one documented on the Umatilla National Forest. Since this species was added to the Regional Forester's sensitive list in 2015 systematic surveys have not been done throughout the Blue Mountain forests. It is possible that there are undiscovered populations of this species both in the Tamarack allotment planning area, and other areas of the Blue Mountains.

Bolander's spikerush (*Eleocharis bolanderi*) is documented about five miles to northeast of allotment (T07S R27E Sec. 7, SW1/4) on Forest Service land. This site burned in the Sunflower flat fire of 2014. It has not been revisited to assess how the plants reacted to the fire. Plants of this species that burned in the Grizzly Bear fire on the Walla Walla Ranger District in 2015 do not appear to be negatively affected by that fire (P. Brooks, personal observations, 2016). Bolander's spike rush grows in vernal wet swales, along intermittent streams, and in wet depressions in moist meadows and lithosols. It is found in slight depressions that hold snow later in the season than surrounding areas. Surrounding forest is usually ponderosa pine. The range of this species includes Cascade and Blue Mountains of Oregon, south to California, east to southeastern Idaho and Utah. It is known from several scattered locations on all three Blue Mountain Forests.

Dwarf evening-primrose (*Eremothera pygmaea*) is a small annual plant in the evening primrose family. This species relies on early spring moisture to flower and fruit in spring. The plant makes seeds and dies by late June. Dwarf evening primrose grows on dry, open bare ground on plains and slopes with unstable soils or in gravel in steep talus, dry washes, banks, and road cuts. Although it is usually associated only with rock and bare ground, it sometimes is found with big sage (*Artemisia tridentata*) or bitterbrush (*Purshia tridentata*).

The range of this species includes central Washington, south through central Oregon, south and east to and southwestern Idaho, northern California, and northern Nevada. In Oregon, it occurs in Grant, Harney Wasco, and Wheeler Counties. There are historic records near both the

Malheur and Umatilla National Forests. There is probably potential habitat for this species in the project area. This species is reported to be about five miles to the southwest of the allotment (T9S R25E Sec. 10). This site is on private or BLM land. This is an old record (1993, by Karl Urban). No specific population or habitat data are available.

Arrow-leaf thelypody (*Thelypodium eucosmum*) is reported from one population on Umatilla National Forest land about two miles southeast of the allotment (T08S R26E Secs. 27 and 34). Several hundred plants were reported in 1993. No more recent information is in the database. Several other populations are documented to the south and west on private and BLM lands. Arrow-leaf thelypody grows under and around western juniper, ponderosa pine, and Douglas fir trees. It grows in canyons, along seasonal creek drainages, and in and around seeps and springs. It is also found in vernal moist areas in ponderosa pine forests and in sage. It is restricted to serpentine and ultramafic soils on Malheur National Forest. The population near the allotment is the only known population on the Umatilla National Forest.

2.2.2 Sensitive plant habitat in the project area

The wide-ranging elevation and precipitation zones of the Umatilla National Forest support a wide diversity of plant species and communities. This diversity includes wet to dry grasslands, sagebrush dominated steppe, wet meadows and diverse riparian areas. Trees adapted to various moisture and temperature regimes define the various forest habitat types. Virtually every habitat may potentially support one or more Forest Service sensitive plant species. Presented below is a general discussion of these habitats. It is not practical to try to quantify how many acres of each habitat type are in the project area. Each sensitive plant species has been assigned to one or more of these habitat types. See Appendix A, "Sensitive Plant Occurrence and Effects Calls" for the list of sensitive species with their associated habitats.

2.2.2.1 Upland habitats

Upland habitats include those areas that not classified as wetlands or riparian areas. Upland habitats occupy the vast majority of acreage, and in general, describe the overall context of the landscape. Only analysis groups thought to be present in the analysis area are included here.

Table 3. Upland habitat analysis groups

Upland habitat analysis group	General habitat description (Dominant and climax species in parentheses) UF = upland forest, UW = upland woodland, US = upland shrubland, UH = upland herbland	Most common plant association groups (PAGs)
Upland forests	<p>Moist Upland Forests - Moist mixed conifer forests at moderate to high elevations. Dominant species include grand fir, subalpine fir, lodgepole pine, Douglas-fir, Engelmann spruce, Rocky Mountain maple, Pacific yew, big huckleberry, twin-flower, queens' cup bead-lily, and heartleaf arnica.</p> <p>Dry Upland Forests - Primarily fire-adapted conifer forests at low to moderate elevations; this is the most common type on the south half of the Forest. Dominant species include ponderosa pine, Douglas-fir, grand-fir, bitterbrush, and snowberry, pinegrass, and elk sedge.</p>	<p>cool wet UF cool moist UF warm moist UF</p> <p>warm dry UF hot dry UF</p>
Juniper woodlands	Woodlands are exclusively characterized as areas where western juniper is the dominant climax species. These communities are found most extensively on the southern half of the Forest. Dominant species include western juniper, mountain mahogany, sagebrush, Idaho fescue, and blue bunch wheatgrass.	<p>hot dry UW hot moist UW</p>
Upland shrublands	Includes upland ecosystems with little or no tree cover; primarily sagebrush steppe and related habitats, but also includes many other less common shrub land systems. Dominant species include big sagebrush, mountain mahogany, bitterbrush, snowberry, shrubby cinquefoil, basin wild rye, Idaho fescue, blue bunch wheatgrass, and prairie junegrass.	<p>cold moist US warm moist US hot moist US warm dry US</p>
Lithosols (scablands)	Often referred to as scablands, lithosols are habitats with very shallow soils on poorly weathered bedrock. Lithosols are often found as small inclusions within a larger matrix of grassland, shrub lands, and woodlands. Dominant species include stiff sagebrush, low sagebrush, Lemmon's needlegrass, and Sandberg's bluegrass.	<p>warm dry US</p>
Grasslands and upland herblands	Grassland habitats are generally dominated by bunchgrasses; this group also includes dry meadows dominated by introduced perennial grasses or native forbs. Dominant species include Idaho fescue, blue bunch wheatgrass, needlegrasses, Great Basin wildrye, and Sandberg's bluegrass.	<p>cool moist UH warm moist UH warm dry UH hot dry UH</p>
Cliffs, rock outcrops, and talus	Cliffs and rock outcrops have vertical faces where very few plants are able to survive. Talus and scree are accumulated boulders, cobbles, and gravel at the base of cliffs or on steep slopes. Dominant species include ferns, mosses, lichens, and sparse low-growing shrubs and herbaceous species.	<p>dry UH</p>

2.2.2.2 Riparian/aquatic habitats

Riparian and aquatic habitats are characterized by a substantial presence of water and/or soil moisture. Aquatic habitats have persistent flowing or standing water. Lakes, streams, marshes and their respective substrates are types of aquatic habitats. Riparian habitats are defined as the moist to wet transition zones between aquatic and upland systems.

Table 4. Riparian and aquatic habitat analysis groups

Riparian/aquatic habitat analysis Group	General habitat description (Dominant and climax species in parentheses) SM = soil moisture, RF = riparian forest, RW = riparian woodland, RS = riparian shrubland, RH = riparian herbland	Most common plant association groups (PAGs)
Riparian forests and shrub lands	<p>This group includes all riparian areas dominated by woody vegetation. These are usually riverine areas along perennial and intermittent streams.</p> <p>Warm Riparian Forests and Shrub lands- This is the most common riparian habitat group on the Forest; it includes the vast majority of actively-managed riparian areas at low to moderate elevations, which have the potential to be dominated by woody vegetation (willows, alder, aspen, black cottonwood, hawthorn, red-osier dogwood, pacific yew, Rocky Mountain maple, grand fir, Douglas-fir, water birch, and currants).</p>	<p>warm high SM RF/RS warm moderate SM RF/RS warm low SM RF/RS hot moderate SM RF/RS hot low SM RF/RS</p>
Aquatic habitats	<p>This group includes habitats that are entirely within flowing or standing or water. This includes lakes, ponds, streams, marshes, and flarks (depressions or hollows within bogs). Dominant species include pondweed, milfoil, creeping spikerush, cattail, torrent sedge, and aquatic mosses.</p>	<p>high SM RH undescribed PAGs</p>
Moist meadows and vernal swales	<p>Moist meadows and vernal swales are saturated in the spring and early summer, but by late summer the water table has significantly fallen below the soil surface yet still retains enough moisture for wetland species to persist. Dominant species include Nebraska sedge, Baltic rush, meadow sedges and false hellebore).</p>	<p>warm moderate SM RH</p>
Groundwater dependent ecosystems (GDEs)	<p>Groundwater-Dependent Ecosystems (GDEs) are typically small, but well distributed on the Forest. They often exist as relatively small inclusions in most other habitat types or form larger complexes with other aquatic, alpine, and wet meadow habitats (many obligate and facultative wetland sedges, grasses, mosses, and shrubs).</p> <p>Spings- GDEs where groundwater emerges and flows into a channel and are often developed for off-site watering of livestock.</p> <p>Seeps- GDEs where groundwater emerges but does not produce perennial flow. These often do not produce enough water for effective off-site water developments.</p> <p>Peatlands and Fens- Peatlands are GDEs that accumulate partially decayed plant matter (peat) over hundreds to thousands of years. Peat (histic soil) is partially decayed plant material that accumulates under saturated conditions where there is little oxygen to facilitate decomposition. Fens are the primary type of peatlands on the Forest.</p>	<p>high SM RF high SM RS high SM RH</p>
Wet meadows	<p>Wet meadows are flooded or saturated throughout the growing season with the water table at or slightly below the soil surface. These areas are typically dominated by obligate wetland species and are characterized by wetland soil types. Often they are features of larger wetland, riparian, or GDE complexes (bladder sedge, aquatic sedge, tufted hairgrass, Holm's Rocky Mountain sedge). Marshes</p>	<p>cold high SM RH cool high SM RH warm high SM RH</p>

Riparian/aquatic habitat analysis Group	General habitat description (Dominant and climax species in parentheses) SM = soil moisture, RF = riparian forest, RW = riparian woodland, RS = riparian shrubland, RH = riparian herbland	Most common plant association groups (PAGs)
Dry and degraded riparian meadows and floodplains	This group includes highly altered and degraded riparian habitats. These areas are characterized by low soil moisture due to lowered water tables and are often dominated by introduced exotic grass species (Kentucky bluegrass, meadow foxtail, orchardgrass) or encroaching conifers	cold low SM RF hot low SM RF warm low SM RS hot low SM RS warm low SM RH

3 Environmental consequences

3.1 General Discussion of Potential Impacts Due to Cattle Grazing

3.1.1 Effects to Federally Listed, Proposed, and Candidate Plant Species

There are no known populations or potential habitat for any federally listed, candidate, or proposed, plant species in the project planning area. Therefore, activities associated with any of the alternatives would have no effect to any federally listed, candidate, or proposed plant species. Therefore, consultation with the USFWS is not necessary for this project. These species will not be further analyzed or discussed in this report.

3.1.2 Direct and Indirect Effects to Documented Sensitive Plant Populations

The only documented sensitive plant species in the allotment is the Clearwater cryptantha. Due to the small stature, early season growth and senescence, and prickly nature, it highly unlikely that cattle target this species as forage. However, some cattle trailing through the populations is occurring (M. Darrach, element occurrence report, 2016). This may lead to indirect effects from erosion, introduction of non-native invasive plants, and changes in water runoff regimes.

3.1.3 Direct and Indirect Effects to Undiscovered Sensitive Species Populations and Habitat

Cattle grazing potentially leads to negative direct effects to sensitive plant species due to ingestion and trampling. Potential indirect effects include changes in shade, soil erosion, nutrient cycling, and water availability relationships. Another indirect effect of grazing is the inability of plants to form mature seed before the heads get eaten by cattle. The use of rotational grazing helps reduce the impacts from this seed predation, since each pasture is rested from grazing periodically.

The majority of habitat in the Tamarack project area consists of upland coniferous forest and juniper woodlands. This habitat experiences relatively low utilization and concentration by livestock. This is due to both low forage production and inaccessibility or steepness of terrain. There are however, some potential impacts to these areas due to grazing, as discussed above.

Non-forested upland habitats including grasslands, sagebrush dominated shrub lands, and lithosols. These areas experience moderate disturbance from livestock activity. The biggest concern for these areas is cattle facilitated introduction, increase, and spread of non-native invasive plants, especially annual grasses. These species often outcompete native species. The other potential negative impact from cattle in these areas comes from soil pedestalling, and erosion that may occur when cattle are in the areas while they are still wet in the spring, or if a big storm hits during the time while the cattle are in the area. Although measures are taken to ensure that cattle are not turned out while soils are wet in the spring, there is no practical way to prevent impacts when storms pass through after the animals are already in the area.

Riparian and wetland areas in the project area include perennial and intermittent streams, wetlands, and many groundwater-dependent ecosystems, which include springs and seeps. These wet habitats experience the majority of utilization and disturbance from livestock activity. This disturbance is most evident as trampled out muddy areas with all vegetation virtually eliminated. Bank shearing, widening of channels, and stream down cutting have been well documented to be attributable to cattle grazing. To reduce these impacts, most of perennial streams, and many of the springs have been fenced to exclude cattle.

3.2 Alternative 1: No Grazing

Under the no grazing alternative, livestock grazing would not be authorized within the project area. Improvements such as fences, gates, and pipelines would generally be removed over time. However, if these improvements are identified as important for other resource needs (e.g., as a water source for wildlife), they could remain in place.

3.2.1 Direct and Indirect Effects to Documented Sensitive Plant Populations

Elimination of all cattle grazing would eliminate any potential negative impacts to Clearwater cryptantha from cattle trailing and other indirect effects. The no grazing alternative should therefore have an overall Beneficial Impact (BI) to populations of Clearwater cryptantha within the project area.

3.2.2 Direct and Indirect Effects to Sensitive Species Habitat

If all cattle grazing were eliminated from the allotment, potential negative impacts to undiscovered populations of sensitive plants (and their associated habitats) from current and future cattle grazing would also be eliminated. Plants subject to direct impacts from grazing, trampling, and soil disturbance would increase, become more vigorous, and would become more stable over time. Species would have a greater chance to reproduce by seed since their seed heads would have a better chance of reaching maturity. Any plants that rely on bare soil for establishment may theoretically become less common in the area. However, wild ungulates would continue to create early seral conditions that species that rely on bare soil need for establishment and sustainability. Negative indirect effects (changes in light, water relationships, and erosion) to species and habitats would also be reduced over time. By eliminating livestock grazing, the quality of currently unprotected aspen, aquatic, wetland, and riparian habitats would be expected to increase due to recovered hydrological processes, reduced erosion, and maintenance of appropriate plant communities. All potential sensitive plant habitat would experience direct and indirect beneficial effects from the absence of livestock grazing. This change would be most dramatic in riparian areas, wetlands, and aspen stands. Therefore, if the no grazing alternative were selected there would be a beneficial impact (BI) to all sensitive plant species and their respective habitats.

3.2.3 Cumulative Effects

Because no management would occur, there would be no proposed action effects to add to ongoing or future actions that would contribute cumulative effects.

3.2.4 Alternative 1 Summary of Effects

If Alternative 1, the no grazing alternative were selected, negative direct and indirect effects to sensitive plant species and their habitats would be reduced and eventually eliminated.

Therefore the biological evaluation call for potential effects to all sensitive plant populations, and their potential habitat is Beneficial Impact over both the short and long term. Because no management would occur, there would be no effects to add to ongoing or future actions that would contribute cumulative effects. Therefore, there will be no cumulative effects to sensitive plants or their habitat from implementation Alternative 1.

3.3 Alternative 2: Current Management

Alternative two would allow the current management of the allotment to continue. It does not propose any new activities. This alternative would continue to authorize 209 cow/calf pairs from May 1 through September 15, using a deferred rotation grazing system. In addition, 44 miles of existing fences (9.25 miles of which is to protect riparian areas), and 62 water developments will be maintained. See the environmental analysis for more details on this alternative.

Ongoing direct and indirect impacts due to grazing would continue under this alternative. See the general discussion of potential impacts due to cattle grazing section above for details of potential direct and indirect impacts to sensitive plant populations and habitats.

PDCs would reduce the risk of detrimental impacts, but would not entirely eliminate the possibility of impacts to habitat and undiscovered populations. None of the sensitive plant species that may occur in the project area are extremely rare on a global scale. Therefore, even if project activities may impact individual plants or habitat, implementation of the Proposed Action should not increase the need for Federal listing of any sensitive species.

3.3.1 Direct and Indirect Effects to Documented Sensitive Plant Populations

See the general discussion above on direct and indirect effects to documented sensitive plant species. Due to the risk of impacts from cattle trailing, the effects call for Clearwater cryptantha for this project is MIIH.

3.3.2 Direct and Indirect Effects to Sensitive Species Habitat

3.3.2.1 Upland Forests and Woodlands

Although this habitat type comprises the majority of the project planning area, it has experienced proportionally lower utilization and concentration by livestock attributed to both low forage production and inaccessibility or steepness of terrain. Much of the upland forest habitat was not specifically surveyed for sensitive plant species, but since most sensitive plant species occur in specific microhabitats, the probability that sensitive plant species may occur in the project planning area in these upland forested habitats is relatively low. Therefore, the effects call for Alternative 2 for species found in upland forests and woodlands is “May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH)”.

3.3.2.2 Cliffs, Talus, and Rock Outcrops

Although alternative 2 would allow continued grazing, cliffs, talus, and rock outcrops see little disturbance from livestock activity. This is primarily due to the fact that these areas provide very low forage capacity and are generally difficult for cattle to access. In addition, they represent a small fraction of project planning area. No new actions are proposed in this habitat type within the project planning area. Therefore, there should be No Impact (NI) regarding direct and indirect effects on sensitive species habitat from Alternative 2 to cliff talus, and rock outcrops.

3.3.2.3 Lithosols

Lithosol areas may be natively impacted by compaction when grazed when wet, and are prone to invasion by non-native annual grasses. Therefore, the effect call for Alternative 2 for lithosol habitats is “May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH).”

3.3.2.4 Upland Shrublands and Herblands

These habitats would continue to have active use by livestock. Therefore the effects call for Alternative 2 for upland shrubland/herbland habitats is “May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species in (MIIH)”.

3.3.2.5 Riparian and Groundwater-dependent Areas

This habitat type is often the most heavily affected by livestock activity, as livestock tend to concentrate around water sources. See the discussion above for details of the potential direct and indirect impacts to riparian and groundwater dependent areas. Many of the perennial streams are currently fenced and generally protected from grazing. These particular areas should have No Impact from grazing, but all the unfenced areas are still subject to grazing impacts. Therefore, the overall call for riparian and groundwater dependent habitats is “May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species in (MIIH)”.

3.3.2.6 Aspen and Warm Riparian Shrubland Communities

Aspen trees in the Blue Mountain area are generally in decline, and so is the habitat for those sensitive species that inhabit aspen communities. The Tamarack area has no documented aspen or other hardwood trees in the corporate GIS layers. Both the district range conservationist (Tim Collins) and the botanists who conducted the project specific botany surveys (Mark Darrach, Sandra Robins, and Laurie Allen) all indicated (personal communication and botany survey records) that there is very little aspen in the allotment. Aspen stands that may be undocumented would be subject to grazing impacts. These areas provide abundant shade and forage, and are very attractive to cattle. Although there is no specific data in the corporate database, other riparian shrub lands are undoubtedly present in the area. Since there is such a small amount of this habitat, the potential effects to this habitat type are relatively small. Therefore, the call for aspen and warm riparian shrubland communities for Alternative 2 is May Impact Individuals or Habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH).

3.3.3 Cumulative Effects

3.3.3.1 Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects

In the past, present, and reasonably foreseeable future, there have been, and will continue to be, projects and activities within the planning area that may cause impacts to sensitive plants and their habitats. Projects and activities that create ground disturbance, change vegetative composition, and change wild and domestic animal grazing patterns may potentially cause detrimental impacts to sensitive plant populations and habitats. These actions include road construction, timber harvest, fuel reduction treatments (landscape and pile burning, lopping and scattering of slash), fire suppression, recreation development, and livestock grazing. In addition, restoration efforts such as road decommissioning, and stream improvements may also potentially impact sensitive plant populations and habitat. It is likely that historical activities have destroyed populations, and altered habitats for sensitive plants. These historical effects are not quantifiable. See the associated EA for the complete list of activities that may contribute to cumulative effects.

Climate change effects may be considered as a component of cumulative impacts. Changes in climate influence vegetation, water, and disturbance frequencies, and these changes, in turn, influence one another. Attempts to quantify the degree of this change would be speculative.

The historical abundance and distribution of sensitive species on the Forest is not known. Past activities have likely affected their current abundance and distribution. Beginning in approximately 1990, botanical surveys and biological evaluations were conducted for Forest Service projects planned and implemented on the forest. Since 1990, protection and management of sensitive species and their habitats (in the form of PDCs, avoidance, or other mitigation) have been included in the design of all projects. This has, and will continue to, reduce the potential of cumulative effects to sensitive plant populations and habitats. Therefore, the cumulative effects that may occur from this project are not at a high enough level to qualify as extenuating circumstances that would require the preparation of an Environmental Impact Statement.

3.3.4 Alternative 2 Summary of Effects

In conclusion, Alternative 2 would continue the grazing and trampling pressure from livestock; Overall livestock utilization would remain very similar to the levels and intensity that it has in the past decade. Improvements and changes to habitat would be extremely slow to occur, on the scale of several years to centuries in some cases. This is mainly guided by slow-to-recover hydrological processes and seral plant community development. There are no known populations or potential habitat for any federally listed, or proposed, plant species in the project planning area. Therefore, activities associated with Alternative 2 would have no effect to any federally listed, proposed, or candidate plant species. Due to the characteristics and habitat of the only sensitive plant in the project area (Clearwater cryptantha), continuation of grazing would have minimal impacts to the two populations in the area. Therefore, the call for the known populations of Clearwater cryptantha for this alternative is May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH). Since cattle will continue to graze most areas in the allotment, and it is not practical to survey 100% of the allotment, there is a possibility that there are unmitigated effects from the ongoing grazing. For this reason, the call for all species for most habitats in the allotment is May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH). The only exception to this is that due to the inherent lack of forage and difficult access, the call for cliffs, talus, and rock outcrops is No Impact (NI).

3.4 Alternative 3: Proposed Action

The proposed action would continue to authorize 209 cow/calf pairs from May 1 through September 15 using a deferred rotation grazing system on 19,441 acres, as discussed above. To improve the distribution of livestock, new upland water developments (spring developments) are proposed. These developments would protect the water sources from cattle grazing. Construction of additional riparian fencing in Dark and Lost Canyon Creeks is also proposed. See the environmental analysis for more details on this alternative.

3.4.1 Project Design Criteria and Mitigation Measures

Project design criteria (PDCs) to protect sensitive plant populations and unique habitats are described below (Table 5). The Umatilla Forest plan goals, objectives and standards listed are outlined in the regulatory framework section near the beginning of this report. No specific mitigations were developed for protection of sensitive plant populations or potential habitat.

Table 5. Project Design Criteria (PDC) for sensitive plants (SP), unique habitats (UNQH), and groundwater-dependent ecosystems (GDE)

Plant, Habitat, or Ecosystem	Objective	Project Design Criteria
SP 1	Objective: To protect known sensitive plant populations and their current habitats by preventing disturbance to the individual plants and the immediate area.	Salting should not be authorized or allowed within one-quarter mile of occupied habitat of threatened, endangered, or sensitive plant species, except when protected by fencing.
SP 2	Objective: To protect known sensitive plant populations and their current habitats by preventing disturbance to the individual plants and the immediate area.	Prior to construction of fences or placement of jackstraw, a botanist should clearly mark sensitive botanical sites to minimize ground disturbance.
SP 3	Objective: To protect known sensitive plant populations and their current habitats by preventing disturbance to the individual plants and the immediate area.	If any new sensitive plant populations are located, a Forest Service botanist will be notified. The population will be evaluated, and a mitigation plan shall be developed in consultation with the botanist.
SP 4	Objective: To protect known sensitive plant populations and their current habitats by preventing disturbance to the individual plants and the immediate area.	Fence construction and other operational activities shall not be allowed in any documented sensitive plant sites unless it is for the demonstrated benefit or protection site.
UNQH 1	To protect from direct disturbance the unique habitats that harbor, or potentially harbor, a number of sensitive plant species. These habitats represent the majority of locations where sensitive species occur on the Umatilla National Forest.	The integrity of unique habitats shall be maintained. Unique habitats [may] include meadows, rimrock, talus slopes, cliffs, animal dens, wallows, bogs [fens], seeps and springs. This shall be accomplished by incorporating cover buffers approximately 100 feet in width during fence-building projects.
UNQH 2	To protect from direct disturbance the unique habitats that harbor, or potentially harbor, a number of sensitive plant species. These habitats represent the majority of locations where sensitive species occur on the Umatilla National Forest.	To the extent possible, constructed fences will be placed outside the channel migration zone (floodplain).
GDE 1	To protect the types of habitat where the largest number of sensitive plants in the forest are found. These criteria will prevent soil and hydrological disturbance during project implementation, specifically relating to spring developments, this will help to maintain the habitat characteristics necessary for sensitive plant populations.	The integrity of groundwater-dependent ecosystems (GDE) shall be maintained. Spring developments shall not dewater GDEs. Spring developments shall not be allowed if the spring is occupied by rare or sensitive plant species, or in peatlands, fens, or where histic soils are present.

Plant, Habitat, or Ecosystem	Objective	Project Design Criteria
GDE 2	To protect the types of habitat where the largest number of sensitive plants in the forest are found. These criteria will prevent soil and hydrological disturbance during project implementation, specifically relating to spring developments, this will help to maintain the habitat characteristics necessary for sensitive plant populations.	Fence construction shall not be allowed in springs, seeps, or any other GDE, unless it is for the benefit or protection of the GDE or development of the spring.
GDE 3	To protect the types of habitat where the largest number of sensitive plants in the forest are found. These criteria will prevent soil and hydrological disturbance during project implementation, specifically relating to spring developments, this will help to maintain the habitat characteristics necessary for sensitive plant populations.	Spring developments should not disturb the spring orifice (point where water emerges). Spring head boxes should be placed in a location that will cause the least amount of disturbance to the soils and vegetation of the GDE. Preferable locations for spring head boxes should be in an established channel downstream from the orifice or a location where flowing water becomes subsurface.
GDE 4	To protect the types of habitat where the largest number of sensitive plants in the forest are found. These criteria will prevent soil and hydrological disturbance during project implementation, specifically relating to spring developments, this will help to maintain the habitat characteristics necessary for sensitive plant populations.	Spring developments shall have a return flow system to minimize the diversion of surface and subsurface water from the catchment area. Consider using a float valve or similar device to reduce the amount of water withdrawn from the GDE.
GDE 5	To protect the types of habitat where the largest number of sensitive plants in the forest are found. These criteria will prevent soil and hydrological disturbance during project implementation, specifically relating to spring developments, this will help to maintain the habitat characteristics necessary for sensitive plant populations.	When developing springs, place troughs far enough away from GDEs, wetlands, and other sensitive or unique habitats to prevent erosion, compaction, or degradation to sensitive soils and vegetation due to livestock congregation.

Many additional PDCs would indirectly benefit sensitive plant populations and potential habitat. They include several to help control the introduction and spread of invasive non-native plants. Soil and riparian PDCs would also reduce potential impacts to undiscovered populations and sensitive plant habitat. See Appendix A of the EA for the complete list of PDCs.

3.4.2 Required Monitoring

Project design criteria should provide some level of protection to sensitive plant populations and potential habitat in the project planning area. However, implementation monitoring is recommended for documented populations of sensitive plants, and for areas where ground disturbing activities are proposed. This would include site visits to areas during and after project implementation. This monitoring would help to ensure that project design criteria are followed and that they are effective in preventing negative impacts to sensitive plant populations and habitat. It would also allow an opportunity to confirm that the assumptions used for development of the project design criteria are correct.

3.4.3 Direct and Indirect Effects to Documented Sensitive Plant Populations

See the general discussion above on direct and indirect effects to documented sensitive plant species. The proposed project design criteria that salting shall not be authorized within one quarter mile of occupied habitat should help to reduce the amount of cattle trailing in the immediate area of the Clearwater cryptantha populations. The PDC that prohibits fence construction in occupied habitat would also help to reduce the chances of negative impacts to Clearwater cryptantha. Additional PDCs that help reduce impacts from cattle and will help to protect the population and additional potential habitat for the species. However, it cannot be stated with certainty that there would be absolutely no potential for negative impacts due to grazing activities. Therefore, the call for Alternative 3 for the documented Clearwater cryptantha populations is May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH).

3.4.4 Direct and Indirect Effects to Sensitive Species Habitat

In general, potential direct and indirect effects to sensitive plant habitat are very similar between Alternatives 2 and 3. See the discussions under general discussion on direct and indirect effects and the discussion of direct and indirect effects for Alternative 2 for details of the potential effects.

Alternative 3 will provide more protection to wetland and riparian habitats due to additional proposed fencing and spring protections. The implementation of these actions will help to protect any undiscovered plants within those exclosures, but ongoing impacts in unprotected areas will continue to occur. Potential impacts to plants in upland habitat are essentially the same as for Alternative 2. Due to the uncertainty of exact locations of sensitive plants in the project area, it must be assumed that there may be some unmitigated negative impacts to undiscovered sensitive plants in the project area.

The proposed spring fencing, and improvement of troughs should reduce trampling of areas with saturated soil and heavy grazing of riparian dependent vegetation in the proposed spring development areas. These changes would allow native vegetation and soil stability to recover. This indirect effect of soil stability and improved hydrological processes during the first few growing seasons would promote the build-up of organic matter within the area over years to decades. This habitat type is associated with many of the Umatilla NF's sensitive plant species. During the riparian enhancement projects, there should be no direct effects to sensitive species or the groundwater dependent ecosystems habitat type. The proposed new spring developments were surveyed in 2016, with no sensitive species detected. Therefore, the Proposed Action alternative should have Beneficial Impact (BI) for riparian and groundwater-dependent areas where spring developments are proposed. There may still be ongoing impacts to unprotected riparian habitats.

Therefore, the effects calls for all sensitive species that may occur in the project area is May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH). Even though this is the same call as for Alternative 2, it is likely that the risk to plants in riparian and wetland areas is relatively a little less for Alternative 3 (due to the planned riparian protections).

3.4.5 Cumulative Effects

Cumulative effects would be essentially the same as for Alternative 2. See that discussion above.

3.4.6 Alternative 3 Summary of Effects

Alternative 3 would allow continued direct and indirect effects from livestock grazing. Overall livestock utilization would remain very similar to the current levels. Improvements and changes to habitat would be extremely slow to occur, on the scale of several years to centuries in some cases. This is mainly guided by slow-to-recover hydrological processes and seral plant community development in these habitats.

The new water developments and fences proposed for Alternative 3 would potentially lead to a reduction in livestock impacts in the immediate areas of the new developments, and their associated riparian areas. As noted above for Alternative 2, species that grow in cliffs, talus, and rock outcrops would have the lowest potential for negative impacts. Therefore, the effects call for species that occur only in these habitats is No Impact (NI). Due to the inability to completely control cattle use in most habitats, the effects calls for species found in all other habitats is May Impact Individuals or Habitat (MIIH).

3.5 Summary of Environmental Effects

The United States Forest Service biological evaluation (BE) process was completed by a journey-level botanist for this project. This process includes a pre-field review of existing information, botanical surveys to search for sensitive plants, and development of project design criteria to protect both known sensitive plant populations and potential sensitive plant habitat. Potential direct, indirect, and cumulative effects to federally listed, candidate, and proposed plant species were analyzed. Potential effects to USFS Region 6 designated sensitive plants and sensitive plant habitat in the project area were also analyzed.

Botany surveys for rare plants were conducted for this project. The only Forest Service sensitive plant species documented in the project planning area is Clearwater cryptantha. Due to the

large size of the project planning area, not all areas of the allotment were surveyed. There is a possibility that there are additional undiscovered populations of sensitive plants within the project planning area.

There are no known populations or potential habitat for any federally listed, or proposed, plant species in the project planning area. Therefore, activities associated with any of the alternatives would have no effect to any federally listed, proposed, or candidate plant species. Therefore, consultation with the USFWS is not necessary for this project.

Cattle grazing has the potential to cause both direct and indirect negative impacts to sensitive plants. Causes of these negative impacts include ingestion, trampling, changes in light and water regimes, accelerated erosion, introduction and spread of non-native invasive plants, and alteration of riparian habitats. Alternative 1, the no grazing alternative would eliminate the direct impacts from grazing in the short term, and habitats would eventually recover from both direct and indirect impacts. Therefore, Alternative 1 would have a Beneficial Impact (BI) to all sensitive plant species and their habitats. Alternative 2, current management will allow current levels of grazing (with many riparian areas fenced and effectively protected from grazing). Since it is not practical to survey 100% of the allotment, there is a possibility that there are unmitigated effects from the ongoing grazing. For this reason, the call for all species for most habitats in the allotment is May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH). The only exception to this is that due to the inherent lack of forage and difficult access, the call for cliffs, talus, and rock outcrops is No Impact (NI). Alternative 3, the proposed action is very similar to Alternative 2. It will provide additional protections to the spring development areas; those particular spots will see a beneficial impact. However, overall, the call for Alternative 3 is the same as for Alternative 2; May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH) for most habitats, and No Impact for cliffs, talus and rock outcrop habitats.

Table 6 compares the three alternatives based upon the potential effects to sensitive species habitat.

Table 6. Summary of effects determination for all alternatives by sensitive species habitat.

Habitat	Alternative 1 No Grazing	Alternative 2 Current Management	Alternative 3 Proposed Action
Upland forests and woodlands	BI	MIIH	MIIH
Cliffs, talus, rock outcrops	BI	NI	NI
Lithosols	BI	MIIH	MIIH
Upland shrubland/herbland	BI	MIIH	MIIH
Riparian and groundwater-dependent areas (includes aquatic, riparian and wetland habitats)	BI	MIIH	MIIH
Aspen/warm to hot riparian shrubland communities	BI	MIIH	MIIH

BI= Beneficial Impact, NI=No Impact, MIIH= May Impact Individuals or Habitat

4 Compliance with Relevant laws, regulations, FS policies and Umatilla NF Forest Plan

4.1 Federal Laws

4.1.1 Endangered Species Act

There are no federally listed, proposed, or candidate plant species (or habitat for any of these species) in the project area. Therefore, this project will have no effect to any of these species, and all alternatives comply with this law.

4.1.2 National Forest Management Act and National Environmental Policy Act

This biological evaluation discloses the existing condition of sensitive plant populations and habitats, and analyzes the potential effects from the proposed activities to these resources. This report therefore provides all necessary scientific information to comply with the National Forest Management Act and the National Environmental policy act.

4.1.3 Forest Service Policy

This biological evaluation discloses the existing condition of sensitive plant populations and habitats, and analyzes the potential effects from the proposed activities to these resources. This report therefore provides all necessary scientific information to comply with Forest Service Manual direction and policies regarding sensitive species and native plant restoration management.

4.1.4 Umatilla National Forest Land and Resource Management Plan

All proposed project activities are consistent with the applicable Umatilla National Forest plan goals, desired future conditions, objectives, standards and guidelines as they relate to botanical resources. The BE process that was undertaken for this project include the pre-field review process to access potential species and habitat in the area, on the ground botanical surveys in high probability habitats, development of project design features, and viability analysis for sensitive plant species.

5 Other Relevant Mandatory Disclosures

There are no other relevant mandatory disclosures related to sensitive plants or other botanical resources for this project.

6 References Cited

Endangered Species Act of 1973. Title 16 United State Code, Sections 1531-1544

USDA Forest Service. Land and Resource Management Plan-Umatilla National Forest. USDA Forest Service, Pacific Northwest Region. 1990.

USDA Forest Service. 2008. Forest Service Manual (FSM 2670, Section 2672.4)

USDA Forest Service. July 13, 2015. Pacific Northwest Regional Forester's Sensitive Species List. Available online at: <http://www.fs.fed.us/r6/sfpnw/issssp/agency-policy/>

USDA Forest Service. Natural Resource Manager (NRM) database. National Forest Service database for sensitive plant data management. Formerly known as NRIS. Not available to the public

USDA Forest Service. 2015. Field Guide to Sensitive Plants of the Malheur National Forest
Unpublished book developed using publically available information and photos

USDA Forest Service. 2006. Sensitive Plants of the Umatilla and Malheur National Forests. USDA Forest Service Pacific Northwest Region. 2006

United States Department of the Interior, Fish and Wildlife Service. Federally listed, proposed, candidates species, and species of concern within Grant County, OR.
http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=41023

United States Department of the Interior, Fish and Wildlife Service. Federally listed, proposed, candidates species, and species of concern within Wheeler County, OR.
http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=41023

7 Appendix A: Sensitive Plants

7.1 Sensitive Plant Occurrence and Effects Calls

Table 7. : Sensitive Liverworts occurrence in the project area and effects of each alternative (see section 1.6.3.2 for explanation of abbreviations in columns 5 and 6)

Scientific name	Common name	Habitat Groups	Presence in planning area	Effects calls for Alternative 1 (No Grazing)	Effects calls for Alternatives 2 and 3
<i>Harpanthus flotovianus</i>	great mountain flapwort	CMF, RP, SD, SW	No habitat	NI	NI
<i>Jungermannia polaris</i>	Arctic flapwort	AQ, RP, SW	No habitat	NI	NI
<i>Lophozia gillmanii</i>	Gillman's pawwort	RK, SD, SW	No habitat	NI	NI
<i>Peltolepis quadrata</i>	shieldscale liverwort	CMF, SW	No habitat	NI	NI
<i>Preissia quadrata</i>	blister ribbon	CMF, RP, SW	No habitat	NI	NI
<i>Ptilidium pulcherrimum</i>	lovely fuzzwort, naugahyde liverwort	CMF, RK, RP, SD, SW, WMF	No habitat	NI	NI

Table 8. : Sensitive mosses occurrence in the project area and effects of each alternative (see section 1.6.3.2 for explanation of abbreviations in columns 5 and 6)

Scientific name	Common name	Habitat Groups	Presence in planning area	Effects calls Alternative 1 -No Grazing	Effects calls Alternatives 2 and 3
<i>Schistidium cinclidodonteum</i>	schistidium moss	RK, RP	No habitat	NI	NI
<i>Tetraphis geniculata</i>	tetraphis moss	CMF, RP, WMF	Suspected	BI	MIIH
<i>Tortula mucronifolia</i>	mucron-leaf tortula moss	CMF, RP, SW, WMF	Suspected	BI	MIIH

Table 9. : Sensitive vascular plant occurrence in the project area and effects of each alternative (see section 1.6.3.2 for explanation of abbreviations in columns 5 and 6)

Scientific name	Common name	Habitat Groups	Presence in planning area	Effects calls Alternative 1 - No Grazing	Effects calls Alternatives 2 and 3
<i>Achnatherum wallowaense</i>	Wallowa ricegrass	GR, LI, RK	Out of range	NI	NI
<i>Allium dictuon</i>	Blue Mountain onion	GR, LI, RK	Out of range	NI	NI
<i>Astragalus diaphanous</i> var. <i>diurnus</i>	transparent milk-vetch	GR, RK	Suspected	BI	MIIH
<i>Astragalus misellus</i> var. <i>misellus</i>	pauper milk-vetch	GR	Suspected/ Undocumented report of species in planning area	BI	MIIH
<i>Boechera atrorubens</i>	sickle-pod rockcress	GR, LI, RK	Out of range	NI	NI
<i>Botrychium ascendens</i>	upward-lobed moonwort	CMF, RP, SW	No habitat	NI	NI
<i>Botrychium crenulatum</i>	crenulate moonwort	CMF, RP, SW	Suspected	BI	MIIH
<i>Botrychium hesperium</i>	western moonwort	CMF, RP, SW	Suspected	BI	MIIH
<i>Botrychium lineare</i>	slender moonwort	CMF, RP, SW	No habitat	NI	NI

Scientific name	Common name	Habitat Groups	Presence in planning area	Effects calls Alternative 1 - No Grazing	Effects calls Alternatives 2 and 3
<i>Botrychium lunaria</i>	common moonwort	CMF, RP, SW	Suspected	BI	MIIH
<i>Botrychium montanum</i>	mountain moonwort	CMF, RP, SW	Suspected	BI	MIIH
<i>Botrychium paradoxum</i>	twin-spiked moonwort	CMF, RP, SW	Suspected	BI	MIIH
<i>Botrychium pedunculatum</i>	stalked moonwort	CMF, RP, SW	Suspected	BI	NI
<i>Calochortus macrocarpus</i> var. <i>maculosus</i>	green banded mariposa lily	GR, RK	Out of range	NI	NI
<i>Calyptidium roseum</i>	rosy pussypaws	GR, RK	Suspected	NI	MIIH
<i>Carex cordillerana</i>	cordilleran sedge	AS, RP, WMF	Suspected	BI	MIIH
<i>Carex diandra</i>	lesser panicled sedge	RP, SW	No habitat	NI	NI
<i>Carex micropoda</i>	timberline sedge	SD, SW	No habitat	NI	NI
<i>Carex retrorsa</i>	retrorse sedge	RP	Suspected	BI	MIIH
<i>Carex saxatilis</i>	limestone or russet sedge	RP, SW	No habitat	NI	NI

Scientific name	Common name	Habitat Groups	Presence in planning area	Effects calls Alternative 1 - No Grazing	Effects calls Alternatives 2 and 3
<i>Carex vernacula</i>	foetid or native sedge	SD, SW	No habitat	NI	NI
<i>Castilleja flava</i> var. <i>rustica</i>	rural paintbrush	SD	No habitat	NI	NI
<i>Castilleja viscidula</i>	sticky paintbrush	SD	No habitat	NI	NI
<i>Comastoma tenellum</i>	slender gentian	SD, SW	No habitat	NI	NI
<i>Cryptantha grandiflora</i>	Clearwater cryptantha	GR, RK	Documented	BI	MIIH
<i>Cryptantha simulans</i>	pine woods cryptantha	GR, RK, WDF	Suspected	BI	MIIH
<i>Cymopterus nivalis</i>	snowline cymopterus	GR, RK	No habitat	NI	NI
<i>Cyperus lupulinus</i> ssp. <i>Lupulinus</i>	Schweinitz's flatsedge	WHR	No habitat	NI	NI
<i>Cypripedium fasciculatum</i>	clustered lady's slipper	RP, WMF, WHR	Suspected	BI	MIIH
<i>Elatine brachysperma</i>	short seeded waterwort	AQ,	No habitat	NI	NI

Scientific name	Common name	Habitat Groups	Presence in planning area	Effects calls Alternative 1 - No Grazing	Effects calls Alternatives 2 and 3
<i>Eleocharis bolanderi</i>	Bolander's spikerush	GR, LI	Suspected	NI	MIIH
<i>Eremothera pygmaea</i>	dwarf evening primrose	GR, LI, RK	Suspected	NI	MIIH
<i>Erigeron davisii</i>	Davis' fleabane	GR, RK	Out of range	NI	NI
<i>Erigeron disparipilus</i>	white cushion fleabane	GR, WDF	Out of range	NI	NI
<i>Heliotropium curassavicum</i>	salt heliotrope	AQ, WHR	No habitat	NI	NI
<i>Lipocarpha aristulata</i>	aristulate lipocarpha	AQ, WHR	No habitat	NI	NI
<i>Listera borealis</i>	northern twayblade	CMF, CDF, RP, SW	Suspected	BI	MIIH
<i>Lomatium pastorale</i>	meadow lomatium	GR, LI	Out of range	NI	NI
<i>Lycopodium complanatum</i>	ground cedar	CMF, RP, WMF	Suspected	BI	MIIH
<i>Muhlenbergia minutissima</i>	annual dropseed	WHR	Suspected	BI	MIIH

Scientific name	Common name	Habitat Groups	Presence in planning area	Effects calls Alternative 1 - No Grazing	Effects calls Alternatives 2 and 3
<i>Ophioglossum pusillum</i>	adder's-tongue	CMF, RP, SW	Suspected	BI	MIIH
<i>Pellaea bridgesii</i>	Bridge's cliff-brake	RK	No habitat	NI	NI
<i>Phacelia minutissima</i>	dwarf or least phacelia	AS, GR, RP, WHR	Suspected	BI	MIIH
<i>Phlox multiflora</i>	many-flowered phlox	GR, RP, WDF	Out of range	NI	NI
<i>Pinus albicaulis</i>	whitebark pine	SD	No habitat	NE	NE
<i>Potamogeton diversifolius</i>	diverse-leaved pondweed	AQ	Suspected	BI	MIIH
<i>Pyrola dentata</i>	tooth-leaved pyrola	CMF, WDF, WMF	Suspected	BI	MIIH
<i>Pyrrocoma scaberula</i>	rough pyrrocoma	GR	Out of range	NI	NI
<i>Rotala ramosior</i>	lowland toothcup	AQ	No habitat	NI	NI
<i>Salix farriar</i>	Farr's willow	SW	No habitat	NI	NI
<i>Salix wolfii</i>	Wolf's willow	SD, SW	No habitat	NI	NI

Scientific name	Common name	Habitat Groups	Presence in planning area	Effects calls Alternative 1 - No Grazing	Effects calls Alternatives 2 and 3
<i>Silene spaldingii</i>	Spalding's catch-fly	GR, WDF	Out of range	NE	NI
<i>Suksdorfia violacea</i>	violet suksdorfia	RP, RK	No habitat	NI	NI
<i>Thelypodium eucosmum</i>	arrow-leaved thelypody	WHR	Suspected	BI	MIIH
<i>Trifolium douglasii</i>	Douglas' clover	RP, GR	Suspected	BI	MIIH
<i>Utricularia minor</i>	lesser bladderwort	AQ	No habitat	NI	NI

7.2 Sensitive Plant Habitat Groups

Table 10: Sensitive plant habitat groups

CODE	Habitat Group
AQ	Aquatic
AS	Aspen
CDF	Cold dry forest
CMF	Cold moist forest
GR	Dry grasslands
LI	Lithosols
RK	Rocky areas
RP	Riparian & wetlands
SD	Subalpine dry
SW	Subalpine wet
WDF	Warm dry forest
WMF	Warm moist forest
WHR	Warm to hot riparian and wetlands

7.3 Effects Calls for R6 Forest Service designated sensitive species

Effects calls used here are those defined by the United States Fish and Wildlife Service (USFWS), Section 7, the Endangered Species Act (ESA) Consultation.

Effects Call Code	Effects Call	Definitions of effects calls
NE	No Effect	There will be no impacts, positive or negative, to listed or proposed resources. Generally, this means no listed resources will be exposed to action and its environmental consequences.
MA-NLAA	May affect, but not likely to adversely affect	All effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are undetectable, not measurable, or cannot be evaluated. Discountable effects are those extremely unlikely to occur.
MA-LAA	May affect, and is likely to adversely affect	Listed resources are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to the exposure.

Effects calls used here are those defined by Forest Service 2670 policy.

Effects Call Code	Effects Call	Definitions of effects calls
NI	No Impact	When a project or activity will have no environmental effects on habitat, individuals, a population, or a species
MIH	May impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species	Activities or actions that have effects that are immeasurable, minor or are consistent with Conservation Strategies would receive this conclusion
WIFV	Will impact individuals or habitat with a consequence that the action may contribute to a trend towards Federal listing or cause a loss of viability to the population or species	Loss of individuals or habitat can be considered significant when the potential effect may be: <ol style="list-style-type: none"> 1. Contributing to a trend toward Federal listing (C-1 or C-2 species) 2. Results in a significantly increased risk of loss of viability to a species
BI	Beneficial Impact	Projects or activities that are designed to benefit, or that measurably benefit a sensitive species

8 Appendix B: Photos of Sensitive Plants



Photo 1. *Cryptantha grandiflora* (Photo credit: M. Darrach)



Photo 2. *Cryptantha grandiflora* herbarium specimen



Photo 3. Astragalus misellus. Photo credit: M. Darrach.



Photo 4. Astragalus misellus seed pods. Photo credit: M. Darrach.

Thelypodium eucosmum (arrow-leaf thelypody)

THEU

Mustard family (*Brassicaceae*)

Elev.: 1,800-5,000 ft.

H&C: p179



(OCA Staff - http://www.oregon.gov/OCA/PLANT/CONSERVATION/pages/profile_theu.asp)

List: Sensitive

ID Period: May-June

Habitat: Under and around Western juniper, ponderosa pine, and Douglas fir. In canyons, seasonal creek drainages, and seeps/springs. Also found in vernal pools in ponderosa pine forests and in sage. Restricted to serpentine and ultramafic soils in Malheur NF.

Key Character: Glenis (to perianth), 20-60 cm tall; flowers lilac-purple, 4 petals, 6-8 mm long, in a dense raceme; fruit spreading, on a 1-5 mm stalk; leaves arrow-shaped, clasping; basal leaves ovate, entire, with a creeping horizontal root-stalk.

Distribution: Local endemic in southeastern OR: John Day Basin, Painted Hills, Aldrich Mountains, and Canyon Mountains near Malheur NF.

Similar Species: Several *Barbarea* species (formerly *Andros*) have purple flowers and clasping stem leaves, but they have fruit that are not siliques, and generally do not have petiole basal leaves.



(Witchcock et al. 1964)



OR Distribution (Oregon Flora Project Atlas)

Photo 5. *Thelypodium eucosmum*. Image is from an unpublished Malheur National Forest plant guide.

Sedge family (*Cyperaceae*)

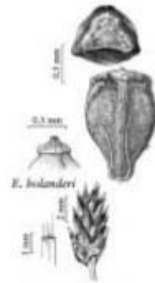
ELBO

Elev.: 3,300–9,000 ft.

H&C: p598



80



Flora of North America



(Hitchcock et al. 1969)

ID Period: May-Oct.

Key Characters: Densely caespitose, perennial, base purplish, with dark sedge-like spikelets (3-8mm); anthers big and showy; fruit 1.5 mm, tubercle on fruit broad and depressed; flower scales dark, fruits golden yellow, three-sided. Plants turn distinctly coppery in the fall.

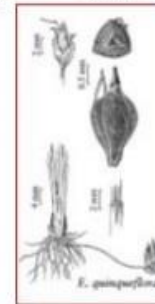
Similar Species: Other *E. acroch* are similar, but most occur in wetter areas and many are much more rhizomatous. *E. quinquefolia* (formerly *E. pacificifolia*) has fruits with a long narrow beak. *E. acroch* has lighter colored fruits with many longitudinal ribs. It is also somewhat rhizomatous. *E. helix* is a tiny annual that also has light colored fruits; it grows in mud around ponds. *Carex fluffosa* is also a short, clumpy *graminoid*, but it has *pericarpia* scales and a male spike of flowers on top of the female flowers.



Habitat on the Maheur NF



OR Distribution (Oregon Flora Project) Atlas



81

63

Eremothera pygmaea (dwarf evening-primrose)

CAPYS

Synonyms: *Comissonia* (*Oenothera*) *pygmaea*

Elev.: 450-5,000 ft.

Evening primrose family (*Onagraceae*)

H&C: p312



(Dana Vissli - <http://biology.burke.washington.edu/herbarium/imagecollection.php>)



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List: Sensitive

ID Period: June-Aug.

Habitat: Dry plains and slopes with unstable soils or in gravel in steep talus, dry washes, banks, and road cuts. Open, bare ground. Sometimes with big sage or bitterbrush.

Key Characters: Erect, glandular-hairy annual. Tiny flowers in spikes, fruit curved, linear-fusiform. Petals 1.5-2.5mm long; stamens - style and stigma. Seeds of flower capsules strongly pilose, dark brown, upper seeds smooth, whitish.

Distribution: Regional endemic (central WA, OR, south and east to and south west ID, and northern CA and northern NV). In OR occurs in Wasco, Wheeler, Grant, and Harney Cos. Historic records near the Malheur NF.

Similar Species: *Eremothera minor* has smaller petals (1-1.5mm), and shorter styles (1.2-2mm). *Eremothera doothii* has stamens < styles and larger petals (2-7.5mm), as well as all seeds alike in capsule.



(Hitchcock et al. 1949)



OR Distribution (Oregon Flora Project Atlas)

Photo 7. *Eremothera pygmaea* (Dwarf evening primrose). Images are from a Malheur National Forest unpublished plant guide.